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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,554	12/09/2003	David H. Walker	D6152CIP2/D/D1	6350

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David L. Parker
FULBRIGHT & JAWORSKI L.L.P
600 Congress Avenue, Suite 2400
Austin, TX 78701

EXAMINER	
BASKAR, PADMAVATHI	
ART UNIT	PAPER NUMBER
1645	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/731,554	WALKER ET AL.	
	Examiner	Art Unit	
	Padmavathi v. Baskar	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Upon further review and reconsideration of the application, the finality of the action mailed on 6/30/06 is withdrawn. Claims 21-23 are pending and under consideration.

Amendment

2. Applicant's amendment filed on 3/29/06 is acknowledged and entered.

New grounds of 35 USC § 112 rejection

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 23 is drawn to "said SEQ ID NO:46" , wherein there is no antecedent basis for said SEQ ID NO:46 (claim 21 recites a composition comprising a polypeptide of SEQ ID NO:46)

Claim Rejections - 35 USC 112, first paragraph

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Given that the invention is drawn to administering "a composition comprising a polypeptide of SEQ ID NO:46, rather than a composition comprising the polypeptide, SEQ ID NO:46, it is assumed for examination purposes that the claims encompass administering polypeptides comprising fragments of SEQ ID NO:46 of as little as two consecutive amino acids which can inhibit *E. canis* infection, wherein said fragments are encoded by "a polynucleotide of SEQ ID NO:45".

Given the indefinite nature of the language of claim 23, it will be assumed for examination purposes that the phrase "wherein said SEQ ID NO:46" refers specifically to the polypeptide comprising fragments of SEQ ID NO:46

6. Claims 21-23 are rejected under 35 USC 112, first paragraph, as lacking an adequate written description in the specification.

Claims are drawn to a method of inhibiting or preventing Ehrlichia canis infection in a subject comprising the steps of: identifying a subject prior to exposure or suspected of being exposed to or infected with Ehrlichia canis; and administering a composition comprising a polypeptide of SEQ

ID NO:46 in an amount effective to inhibit Ehrlichia canis infection, wherein said SEQ ID NO:46 is encoded by a polynucleotide of SEQ ID NO:45, wherein said SEQ ID NO:46 is dispersed in a pharmaceutically acceptable carrier, although drawn to DNA arts, the findings in University of California v. Eli Lilly and Co., 119 F.3d 1559, 43 USPQ2d 1398 (Fed. Cir. 1997) and Enzo Biochem, Inc. V. Gen-Probe Inc. are relevant to the instant claims. The Federal Circuit addressed the application of the written description requirement to DNA-related inventions in University of California v. Eli Lilly and Co., 119 F.3d 1559, 43 USPQ2d 1398 (Fed. Cir. 1997). The court stated that "[a] written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." Id. At 1567, 43 USPQ2d at 1405. The court also stated that a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA" without more, is not an adequate written description of the genus because it does not distinguish the genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function, as we have previously indicated, does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is Id. At 1568, 43 USPQ2d at 1406. The court concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id.

Finally, the court addressed the manner by which a genus of cDNAs might be described. "A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to the members of the genus, which features constitute a substantial portion of the genus." Id.

The Federal Circuit has recently clarified that a DNA molecule can be adequately described without disclosing its complete structure. See Enzo Biochem, Inc. V. Gen-Probe Inc., 296 F.3d 1316, 63 USPQ2d 1609 (Fed. Cir. 2002). The Enzo court adopted the standard that "the written description requirement can be met by 'show[ing] that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics ....i.e., complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics. " Id. At 1324, 63 USPQ2d at 1613 (emphasis omitted, bracketed material in original).

The inventions at issue in Lilly and Enzo were DNA constructs per se, the holdings of those cases are also applicable to claims such as those at issue here. A disclosure that does not

adequately describe a product itself logically cannot adequately describe a method of inhibiting or preventing infection using said product.

Thus, the instant specification may provide an adequate written description of a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent e. canis infection, per Lilly by structurally describing a representative number of "structural features common to the members of the genus, which features constitute a substantial portion of the genus." Alternatively, per Enzo, the specification can show that the claimed invention is complete "by disclosure of sufficiently detailed, relevant identifying characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics."

In this case, the specification does not describe a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection in a manner that satisfies either the Lilly or Enzo standards. The specification does not provide the complete structure of a polypeptide of SEQ ID NO: 46 a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection nor does the specification provide any partial structure of a polypeptide of SEQ ID NO: 46 a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection nor any functional characteristics coupled with a known or disclosed correlation between structure and function. Although the specification discloses a single isolated polypeptide comprising the amino acid sequence SEQ ID NO:46 a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection this does not provide a description of an a polypeptide SEQ ID NO: 46 a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection that would satisfy the standard set out in Enzo.

The specification also fails to describe a polypeptide of SEQ ID NO: 46 by the test set out in Lilly. The specification describes only a single isolated polypeptide comprising the amino acid sequence SEQ ID NO:46 a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection. Therefore, it necessarily fails to describe a "representative number" of such species. In addition, the specification also does not describe "structural features common to the members of the genus, which features constitute a substantial portion of the genus."

Thus, the specification does not provide an adequate written description of a polypeptide of SEQ ID NO: 46 a composition comprising a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection that is required to practice the claimed invention. Since the specification fails to adequately describe the product to which the claimed a polypeptide of SEQ ID NO: 46 that can be used to inhibit or prevent *E. canis* infection it also fails to adequately describe a composition comprising said a polypeptide of SEQ ID NO: 46 and a method of using said composition comprising said a polypeptide of SEQ ID NO: 46 that can be used to inhibit or

prevent *E. canis* infection.

Claims 21-23 do not comply with 35 USC 112, first paragraph because it is not supported by an adequate written description in the specification.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohashi et al 1998 (see IDS # C24 3/15/04, Infec.Immun, 66; 132-139) in view of Ohashi et al 1998 (see IDS # C23, 3/15/04, J.Clin. Microbiol, 2671-2680) .

Claims are drawn to a method of inhibiting or preventing Ehrlichia canis infection in a subject comprising the steps of: identifying a subject prior to exposure or suspected of being exposed to or infected with Ehrlichia canis; and administering a composition comprising a polypeptide of SEQ ID NO:46 in an amount effective to inhibit Ehrlichia canis infection, wherein said SEQ ID NO:46 is encoded by a polynucleotide of SEQ ID NO:45, wherein said SEQ ID NO:46 is dispersed in a pharmaceutically acceptable carrier.

Given that the invention is drawn to administering "a composition comprising a polypeptide of SEQ ID NO:46, rather than a composition comprising the polypeptide, SEQ ID NO:46, it is assumed for examination purposes that the claims encompass administering polypeptides comprising fragments of SEQ ID NO:46 of as little as two consecutive amino acids which can inhibit *E. canis* infection, wherein said fragments are encoded by "a polynucleotide of SEQ ID NO:45.

Given the indefinite nature of the language of claim 23, it will be assumed for examination purposes that the phrase "wherein said SEQ ID NO:46" refers specifically to the polypeptide comprising fragments of SEQ ID NO:46

Ohashi et al 1998 Inf.Immun C24 teach 28-30 KD *E.chaffeensis* p28 protein is an immunodominant outer membrane protein (see figure 2 A and 2B) that binds to serum obtained

from patients infected with E. chaffeensis (see figure 3, abstract and figure 9). This protein has been shown to be immunoprotective when mice were administered recombinant p28 protein and challenged *E.chaffeensis* (see page 137, left column first and second paragraphs). Thus the prior art teaches a method of inhibiting *E. chaffeensis* infection using 28-30 KD antigens of *E. chaffeensis* in a pharmaceutically acceptable carrier, buffer. The prior art teaches as set forth above but the prior art does not teach a method of inhibiting *E. canis* infection using a polypeptide, SEQ.ID.NO: 46.

Ohashi et al. J.Clin. Microbiol, 1998 C23 teach immunodominant outer membrane protein 30KD of *E.canis* (see abstract and figure 1) that binds to serum from mice immunized with recombinant rP30 protein and the sera obtained from infected patients were reactive to rP30 antigen from *E.canis* (see figure 1).

Further, the reference specifically teaches the sequence of the 30 KD antigen (see figure 2, p. 2673) wherein comparison of the sequence set forth for p30 and the sequence of SEQ ID NO:46 reveals substantial identical to the instantly claimed SEQ ID NO:46. Thus, the prior art polypeptide is "a polyp tide of SEQ ID NO:46".

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have substituted the 30 KD outer membrane E. canis immunodominant protein of Ohashi et al for the P28 KD outer membrane E chaffeensis immunodominant protein and to administer a composition comprising said protein to provide immunoprotection for mice against E. canis because both the 28 kd protein and the P30 KD are Ehrlichia bacteria, both are outer membrane proteins, therefore accessible to the immune system, both proteins are immunodominant proteins, both have been shown to bind serum obtained from patients and mice infected with Ehrlichia bacterium. Given the similarity of immunoparameters of the two proteins from Ehrlichia bacterium, given the successful immunoprotection provided by the 28 KD protein, one would have had a reasonable expectation of success in inhibiting E. canis infection with the same protocol but with immunodominant outer membrane 30 KD protein specific to E. canis. Given the above, one would have had a reasonable expectation of success in providing immunoprotection with the method of the combined references. One would have been motivated to substitute 30 KD protein specific to E. canis instead of E.chaffeensis because it would help to inhibit or prevent E. canis infection in experimental animals. Therefore, the claimed invention is prima facie obvious over Ohashi et al 1998 (C24) in view of Ohashi et al 1998 (C23) absent any convincing evidence to the contrary.

Although the references do not specifically teach that the administered composition of the combined references will provide immunoprotection, given that the administered composition of the prior art comprises an Ehrlichia bacterium immunodominant outer membrane antigen with the same immunoproperties, that is the ability to bind to antibodies produced in both patients and animal models infected with Ehrlichia, wherein both proteins are from the outer membrane, it

appears that the method of the combined prior art and the composition of the combined prior art are the same as the instantly claimed method and composition, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to establish that the product of the prior art does not possess the same material, structural and functional characteristics of the claimed product, In the absence of evidence to the contrary, the burden is on the applicant to prove that the claimed product and method is different from that taught by the prior art and to establish patentable differences. See In re Best 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and Ex parte Gray 10 USPQ 2d 1922 (PTO Bd. Pat. App. & Int. 1989).

Some of applicant's arguments drawn to the previous rejection of claims 21-23 under 35 U.S.C.103 are relevant to the instant rejection.

Applicant argues 3/29/06 that the claims concern methods of inhibiting or preventing E. canis infection in an individual by administering a composition comprising a polypeptide of SEQ ID NO:46 in an amount effective to inhibit Ehrlichia canis infection. Ohashi C23 concerns serodiagnosis of E. canis by assaying for one of three p30 kDa outer membrane proteins, none of which are SEQ ID NO:46. Ohashi C24 concerns identification and characterization of p28 kDa proteins in E. chaffeensis and includes protection against E. chaffeensis challenge in rP28-immunized mice. It is not obvious to employ a p30 E. canis protein for inhibiting infection when the proteins are described as being serodiagnostic, nor is it obvious to use an E. chaffeensis p28 protein to inhibit an E. canis infection.

The argument has been considered but found to be nonpersuasive for the reasons set forth in the new grounds of rejection under 35 U.S.C. 103 set forth above . further, it is noted for applicant's convenience that applicant is arguing limitations not recited in the claims as currently constituted, the claims are not drawn to SEQ ID NO:46, but rather are drawn to a composition comprising a polypeptide of SEQ ID NO:46.

Applicant's argues that there is no suggestion or motivation to utilize the p30 E. canis protein because Ohashi C23 reference solely concerns serodiagnosis of E. canis .

The argument has been considered but found to be nonpersuasive for the reasons set forth above in the new clarified grounds of rejection under 35 USC 103.

Applicant argues that Ohashi C23 refers to the particular sequences of P30, P30-1, and P30a in Figure 2, none of these sequences teach or suggest SEQ ID NO:46 and was not disclosed until the filing date of the present application and presents Exhibit 1-3.

The argument has been considered but found to be nonpersuasive because regardless of when the accession number was created, the sequence of the 30kd antigen is set forth in the reference. It is noted that applicant admits on the record, in the response submitted march 29,

2006 that the prior art protein provides a sequence not identical to, but similar to SEQ ID NO;46, thus it clearly meets the limitations of the claims as currently constituted.

Remarks

9. No claims are allowed.

Conclusion

10. Papers related to this application may be submitted to Group 1600, AU 1645 by facsimile transmission. Papers should be transmitted via the PTO Fax Center, which receives transmissions 24 hours a day and 7 days a week. The transmission of such papers by facsimile must conform to the notice published in the Official Gazette, 1096 OG 30, November 15, 1989. The Right Fax number is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PMR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PMR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Padma Baskar Ph.D., whose telephone number is ((571) 272-0853. A message may be left on the Examiner's voice mail system. The Examiner can normally be reached on Monday to Friday from 6.30 a.m. to 4.00 P.M except First Friday of each bi-week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Siew can be reached on (571) 272-0787.

Susan Ungar

SUSAN UNGAR, PH.D
PRIMARY EXAMINER

Padma Baskar Ph.D.